A more diverse selection in any area from the varied menu of potential PCS approaches is another potentially significant benefit of five rather than a smaller number of licenses.

My analysis in Sections IV and V shows that the market is likely to be competitive if only three PCS licenses are awarded per service area, even if some of these licenses are held by local LECs and cellular operators. While recognizing that there may be significant cost savings to be realized from allowing LECs and cellular companies to offer PCS, the NPRM expresses concern that these economies of scope-based savings will be realized at the expense of competitive vigor. My analysis suggests that this is not likely to be the case. However, to the extent that a larger number of licenses allows the Commission to feel secure in getting the benefits of both vigorous competition and economies of scope from LEC and cellular participation in PCS, this must also be considered an advantage of five licenses.

VI. LECs should be allowed to participate fully in PCS

Given the history of telecommunications regulation in the last twenty years, it is natural to think of the issue of LEC participation in PCS in terms of tradeoffs between competition and cost efficiencies that may be realized by integrated full-service organizations.

A. Limiting LECs' participation in PCS would threaten their ability to fulfill their traditional universal service obligations

The efficiency-competitiveness tradeoffs that PCS raises are important and should be addressed. In the process, the potential of PCS to transform the nature of telecommunications services must be kept firmly in mind. PCS has the potential to transform telecommunications in a way that previous new technologies could not. All of the regulatory attempts to deal with efficiency-competition tradeoffs since the divestiture have dealt with services that were either supplements to POTS (plain old telephone service), like cellular telephony, or, like information services, enhancements to POTS that made it less plain and less old. PCS is different because it could easily become the new standard for universally available telecommunications service. PCS will be functionally superior to current landline services (and to cellular in certain ways), and its prices, depending on the type of service, should span a broad middle ground between cellular and landline prices. A number of analysts have predicted that a substantial fraction of telephone users will eventually subscribe to PCS. For example, Clifford Bean and Malcolm Ross of Arthur D. Little predict 60 million PCS subscribers by 2002.[26] Thus, limiting LECs' ability to participate in PCS could effectively relegate them to secondary status in the future

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[26] Bean, C. and Ross, M., "True Wirelessness: A Whole New Ball Game," *Prism*, Second Quarter, 1992, 43-46.

telecommunications industry. This would risk repeating for the LECs the now acknowledged regulatory error of constraining railroads' ability to flexibly adapt to new circumstances and technologies, which made them uncompetitive with other modes of transportation and ineffective in serving the needs of the customers they retained.[27]

The possibility that LECs may not be able to participate in PCS, or at least not fully, is troubling in three respects. First, if the LECs cannot take full advantage of new technologies, their customers can't either. LECs traditionally have had broad service obligations requiring them to provide service to customers that less regulated carriers are likely to find unattractive. So those telephone customers with the fewest options to LEC services would also have to accept service based on an out-of-date technology with relatively low functionality. Thus denying LECs the right to fully participate in PCS could dramatically curtail their utility in their traditional role as guarantors of universal access to high quality telecommunications services.

Second, and perhaps more troubling is the possibility that many LECs will no longer be financially able to carry out their traditional roles as common carriers with universal service obligations, even if we allow for the provision of less than state of the art service. This possibility arises

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[27] 1976 United States Code, Congressional and Administrative News, Railroad Revitalization and Regulatory Reform Act of 1976, p. 17.

due to the interaction of three factors: (1) high non-traffic-sensitive costs; (2) rate averaging obligations; and (3) significant differences in the marginal costs of providing service to different types of customers.

With LEC prices determined under these conditions, LEC customers who can be served at relatively low marginal cost may find it to their advantage to turn to competitive carriers who, unburdened with rate averaging and universal service obligations, may find it profitable to offer them service at less than LEC prices--even when the alternative carriers incur higher costs in serving these customers than do the LECs at the margin. Thus, regulatory obligations and pricing policies may create incentives to inefficient bypass of LEC facilities.

Prevention of socially wasteful bypass of this sort has been one of the traditional justifications for restricting local exchange competition.[28] If low cost users defect to less regulated carriers, a LEC will be forced to raise prices to its remaining customers both because of lost economies of scale and because it will now be serving a higher cost mix of customers. This in turn could trigger additional customer losses as the now higher prices drive still more LEC customers to other carriers. This process of rising prices leading to reduced LEC sales and vice versa could proceed to

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[28] For a more comprehensive treatment of this issue, see Panzar, J. "The Economics of Telecommunications Infrastructure Enhancement," April 4, 1990.

the point where the LEC is no longer able to meet its universal service and rate averaging obligations.

When competition from other carriers is permitted, LECs, their customers, and the efficiency objectives of public policy are best served by allowing LECs to match the price offers other carriers make to the low marginal cost customers. As long as these prices cover the marginal cost of service and make some contribution to other costs, LEC prices to their captive customers will be lower than they otherwise would be, and consumer welfare will be higher.[29]

The rationale for allowing LECs to meet the prices of competitors applies to product and service competition as well. The effects on LECs and their customers of defections to competitors offering more desirable services is exactly the same as the effects of business lost to competitors with lower prices. In the case of service competition, the policy prescription is to allow LECs to match their competitors' service offerings with similar services of their own.

The extent to which LECs and LEC customers may be hurt by restrictions on LEC PCS offerings will depend on the degree to which current landline customers will be inclined to switch to PCS offerings if the LECs can't provide them.

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[29] In fact, in some circumstances it may even be beneficial to allow a LEC to match competitive price offers over a range that extends below its own marginal cost of service. Einhorn, M., "Optimality and Sustainability: Regulation and Intermodal Competition in Telecommunications," *RAND Journal of Economics*, Vol. 18, Winter 1987, 550-563.

Projections of high penetration rates for various PCS services imply a serious threat to LECs and the specter of significantly higher prices for the landline customers they retain. The deleterious impact of restrictions on LECs' participation in PCS could be particularly severe in rural areas where costs are especially high and differences in the marginal costs of serving different classes of customers (businesses in small towns and farm families for example) are often very large.[30]

Third, and finally, limiting LECs' participation in PCS would tie the hands of an important set of firms that, by virtue of their experience providing service in local areas and their broad participation in the telecommunications industry in general, could apply valuable knowledge and insight to the development of PCS that otherwise would go untapped. The development of locally-oriented services in particular could benefit from LEC participation.

B. Efficiency-competitiveness tradeoffs

LECs offer the strong likelihood of significant economies of scope in the provision of PCS and wireline services. LEC participation may therefore make a valuable contribution to economic efficiency by reducing PCS costs and

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[30] Even if the ability to respond to the offerings of competitive carriers were not an issue, it might still be desirable to allow LECs to offer PCS because it now appears that PCS technology will be the lowest cost option for providing telephone service in certain circumstances. Examples are the possible use of PCS to replace BETRS equipment for wireless rural loops and certain urban applications of wireless where inside wiring is extremely costly.

providing another avenue for technological and service innovation.

Another issue is the perception that LEC participation may reduce the vigor of competition in PCS. Theoretically, allowing LECs to provide PCS might harm competition in telecommunications services in either of two ways. (1) regulated LECs might employ unfair competitive practices such as predatory pricing and discrimination in access services; or (2) granting a LEC a PCS license reduces the number of competitors for some, but not all, PCS services by one, which potentially could lead to less competitive pricing. The Commission has recognized that nonstructural safeguards are generally effective in preventing anticompetitive conduct by LECs in many industries. There is no reason why nonstructural safeguards against discrimination should not be just as effective for LEC participation in PCS. Furthermore, LEC facilities probably will not constitute bottlenecks for PCS operators that could be used to further anticompetitive ends, given the evidence that a number of other types of communications firms, such as cable television operators, see their own infrastructures as complementary to PCS.

Two factors must be considered in assessing the likely competitive impact of allowing a LEC to control a PCS license in its service area. One is the effect of the LEC-PCS combination on the marginal cost of the PCS service. Firms with lower marginal costs have an incentive to be more

aggressive price competitors; so reduced marginal costs for a combined PCS-LEC operation may lead to lower market prices even when the effect of eliminating a competitor would otherwise cause prices to rise. There is also the social resource savings associated with being able to provide PCS at a lower cost.

The second factor is market structure, where structure refers to the number and diversity of firms serving the market. A market becomes more competitive the more numerous and the more diverse are the firms in it, at least up to a point. Formulating a common strategy and policing members' adherence to it becomes increasingly difficult as the number of firms whose activities must be coordinated increases. This is the reasoning reflected in the market concentration standards of the U.S. Department of Justice Merger Guidelines.[31] A merger that might otherwise raise competitiveness concerns may also be allowed if it is expected to generate significant cost savings. Cost savings due to LEC-PCS (or cellular-PCS) economies of scope should be treated in the same manner.

The importance of factors other than concentration in determining the competitiveness of a market is well appreciated, and there is both strong empirical evidence and theoretical support that markets with only three competitors

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[31] U.S. Department of Justice Merger Guidelines--1992, 5 Trade Reg. Rpts. (CCH) ¶13.104, at 20, 573-7 (1992).

may behave competitively.[32] Diversity in product offerings and differences in the business operations of competitors are among the most important of the other factors that might predispose an industry to competitive behavior because, as is explained in the *Guidelines*,

> [r]eaching terms of coordination may be limited or impeded by product heterogeneity or by firms having substantially incomplete information about the conditions and prospects of their rivals' businesses, perhaps because of important differences among their current business operations. In addition, reaching terms of coordination may be limited or impeded by firm heterogeneity, for example, differences in vertical integration or the production of another product that tends to be used to together with the relevant product.[33]

The market that will include PCS once it is licensed will be one with both numerous and diverse competitors. PCS is expected to be a family of services filling various market niches. Within an MSA or RSA, we currently see two cellular operators competing with each other and with up to a dozen or more paging companies to service various communication needs. SMR and the new enhanced SMR services, of which there may be several licensed per service area, also compete in this

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[32] See, e.g., Werden, G. and Bauman, M., "A Simple Model of Competition in which Four are Few but Three are Not," *Journal of Industrial Economics*, vol. 34 (March 1986), 331-335; and Kwoka, J., "The Effect of Market Share Distribution on Industry Performance," *Review of Economics and Statistics*, vol. 61 (1979), 101-109.

[33] Guidelines Section 2.11. R. Caves and M. Porter, "From Entry Barriers to Mobility Barriers," *Quarterly Journal of Economics*, 91 (May 1977), 241-261, probably provide the most complete statement of the theory linking firm and product heterogeneity to competitive behavior. See also Newman, H.H., "Strategic Groups and the Structure-Performance Relationship," *Review of Economics and Statistics*, 60 (August 1978), 417-427, for empirical support for this proposition.

market. In addition, low earth orbit satellites are expected to be available as another alternative to cellular or PCS service in the future. PCS competes (or will compete) with a variety of private radio services to meet certain demands. Accordingly, I conclude that the likelihood of collusion with three or more PCS carriers (even if one PCS carrier is owned by a LEC) is very low.

V. Cellular carriers should be permitted to obtain PCS licenses in their service areas

The pros and cons of allowing cellular carriers to obtain PCS licenses in the same areas are similar to those raised by the prospect of LECs holding PCS licenses in most respects. Joint provision of PCS and cellular service is appealing because this may produce significant cost savings due to economies of scope. On the other hand, as with the LECs, there is concern that the market will be less competitive. For the most part, the analysis of the cellular situation parallels that of the LECs.

Cellular operators do not control bottleneck facilities or have the ability to engage in cross-subsidization or anticompetitive discrimination. The apparent availability of cable companies, LECs, competing cellular carriers, SMR operations, and alternative access providers as potential suppliers of basic infrastructure services for PCS makes the possibility of discriminating in this way appear remote, even if there was an incentive to do so.

There are also likely to be significant economies of scope between PCS and cellular service due to both technological complementarities, such as the sharing of switches and towers, and the applicability to PCS of cellular operators' experience in dealing with problems such as roaming agreements. As with LECs, cellular operators' knowledge of their local markets and their experience in the provision of telecommunications services should make them important sources of innovation in the development of PCS--especially for innovative services targeted to the special needs of their service areas.

A difference between the LEC and cellular situations is that there are two cellular licensees in each market, but only one LEC. Allowing each cellular carrier to obtain a PCS license would eliminate two independent competitors--compared to the elimination of a single competitor if the LEC holds a PCS license. Together, LECs and cellular carriers could claim spectrum that otherwise could support up to three additional competitors (but often just two in light of the wireline set-aside for cellular).

Allowing cellular operators to hold PCS licenses should not be a concern. The analysis of the number and diversity of competitors (both current and emerging) in the communications market developed in the previous section suggests that this market should be competitive even without PCS. Given the wide range of different types of

communication firms interested in developing PCS services, it is unlikely that all PCS licenses in an area will be controlled by cellular carriers and LECs. If five (or even just four) licenses are awarded, both the diversity and the number of competitors will rise in any case. Therefore, whether LECs or cellular operators hold PCS licenses should not raise serious competitiveness concerns. Likely economies of scope justify encouraging these combinations and outweigh concerns about possible anticompetitive effects.

VI. Assessing the merits of auctions and restricted lotteries

The burdens of administering previous spectrum lotteries have led the Commission to request comments on the merits of alternative lottery mechanisms and on the feasibility and desirability of auctions for licenses. Of particular concern has been the administrative effort and expense required to process lottery applications that have been filed for purely speculative purposes.

Spectrum auctions are attractive in part because certain benefits of auctions are obvious, while the drawbacks are more subtle. Obvious benefits are: (1) revenue to the government, and (2) competitive bids are likely to put spectrum in the hands of those who value it most at the very beginning. The problems of speculative filings for licenses awarded by lottery presumably would be avoided by auctions.

Typically overlooked in assessments of the merits of lotteries are the flexibility advantages of licenses that are granted subject to continued approval by regulators. The quid pro quo of licenses granted by lotteries is the right of government authorities to periodically review current uses of given parcels of spectrum to determine whether they might contribute more to social welfare if reassigned to other purposes. We know from recent work on network industries that market forces will not always lead to the adoption of beneficial new technologies and services when they must displace established services that are well entrenched.[34] In these cases it is appropriate that the government mandate a change, which in the case of spectrum-using industries may require the reassignment of licenses.

The analysis of Section II.B.2, where it was shown that licenses to large service areas could lead to market failures in which socially advantageous local approaches might not be developed, also implies a bias against new spectrum-using services and technologies, since new services are likely to start out as local experiments. Finally, licenses sold at auction imply much stronger property rights in spectrum; so that costly and time consuming legal procedures based on eminent domain-type principles may be required to clear spectrum for purposes deemed more beneficial.

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[34] David, P., op. cit., and Besen, S. and Saloner, G., op. cit..

Among the proposals for reducing the administrative headaches associated with speculative lottery filings for PCS licenses have been suggestions that lottery winners be required to build out their service areas within a specified amount of time after licenses are awarded, and that transfers of licenses be prohibited for a substantial time (perhaps three years) after the receipt of the license. Both of these proposals have the potential to seriously retard the development of PCS in its early, formative years. Post lottery build-out requirements run the risk of hasty build-outs that will burden the industry with the sunk costs of initial investments in services and technologies that were not well thought out. By creating an incentive to build out quickly with technologies currently available, build-out requirements would also limit the range of experimentation with new technologies and services, and would reduce the speed with which winning approaches could be implemented.

License transfer restrictions could have two adverse affects. One mechanism by which better approaches to PCS may spread throughout the industry is for the firms developing these approaches to acquire additional licenses to apply them in new areas. Post-lottery transfer restrictions could seriously retard beneficial transactions of this type. Similarly, post-lottery transfer restrictions could slow the pace at which more efficient owners and managers are able to acquire control of industry assets (including licenses) and spread the benefits of their efficiencies.

VII. Summary and recommendations.

After reviewing the evidence and the arguments for different licensing policies for PCS, I have come to the following conclusions: (1) relatively small service areas have distinct advantages over larger service areas, which favors MSAs and RSAs; (2) five licenses per service area is preferable to the possibilities raised for comment in the NPRM of awarding only three or four licenses per service area; and (3) both LECs and cellular operators should be allowed to participate in PCS under the same terms and conditions that will be applied to all other applicants and licensees.

Licensing small service areas will promote the development of a healthy PCS industry by permitting a greater degree of experimentation with alternative approaches to PCS during the industry's early years when it is still developing its services and technologies. In addition, the network nature of PCS services will make it harder to partition large license areas to create smaller service areas than to combine small license areas to put a larger area under the control of a single operator. Thus, licensing large service areas would create a bias in favor of wide-area approaches to PCS and against small-area approaches targeted to the particular needs of individual communities, and this bias would operate irrespective of the economic and social merits of local versus wide-area approaches.

The development of regional clusters of contiguous license areas under common management in the cellular industry has been offered as evidence in favor of licensing larger service areas for PCS. My examination of the evidence for regional clustering suggests that it is not nearly so pervasive as has been presumed, and for the most part clusters neither approximate MTA or BTA boundaries nor approach MTAs or BTAs in size.

Five licenses per license area has definite advantages for promoting experimentation with alternative approaches to PCS because the larger number of licenses will permit more market experiments to take place. The likelihood of a more diverse mix of PCS services within any local communications market is another advantage of five licenses.

LECs should be permitted to participate fully and equally in PCS anywhere, including the areas in which they provide landline services because it is highly likely that significant cost savings and service enhancements will be realized due to economies of scope in shared infrastructure and managerial expertise. Cellular carriers should also be allowed to be full and equal participants in PCS in the areas in which they provide cellular service for exactly the same reasons. The numbers and diversity of product offerings, organizational structures, and complementary infrastructures that will characterize the market in which PCS providers will compete will make anticompetitive collusion very difficult--

even if LECs and cellular operators hold PCS licenses in the same local market. Therefore, concerns over the vigor of competition in telecommunications services should not be a bar to full participation in PCS by LECs and cellular operators.

I also concluded that lotteries have certain advantages over spectrum auctions, and that restrictions on post-award transfers or rapid build-out requirements would be detrimental to the efficient development of PCS.

ILLUSTRATION 1

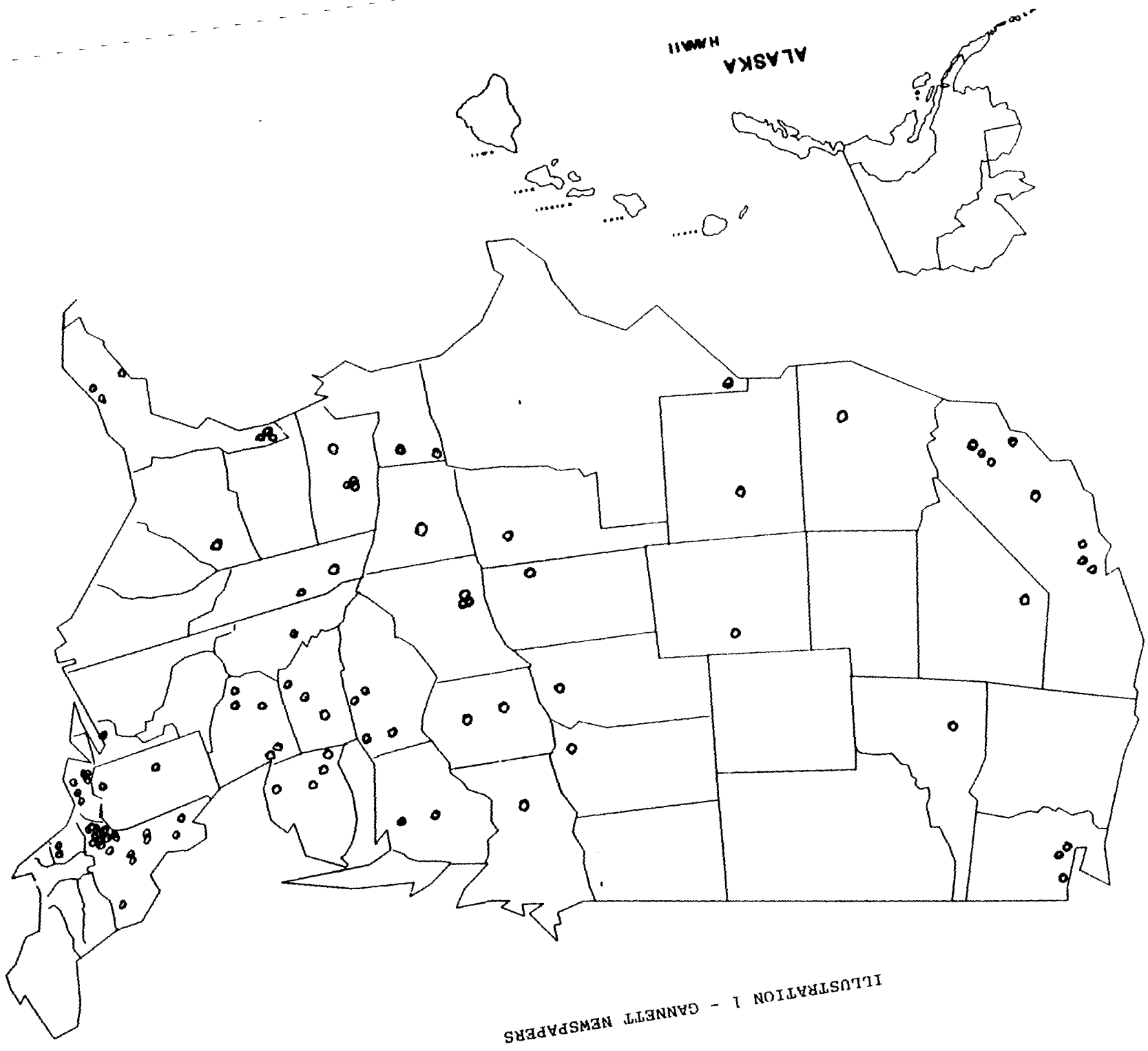


ILLUSTRATION 1 - GANNETT NEWSPAPERS

ILLUSTRATION 2 - THOMSON NEWSPAPERS

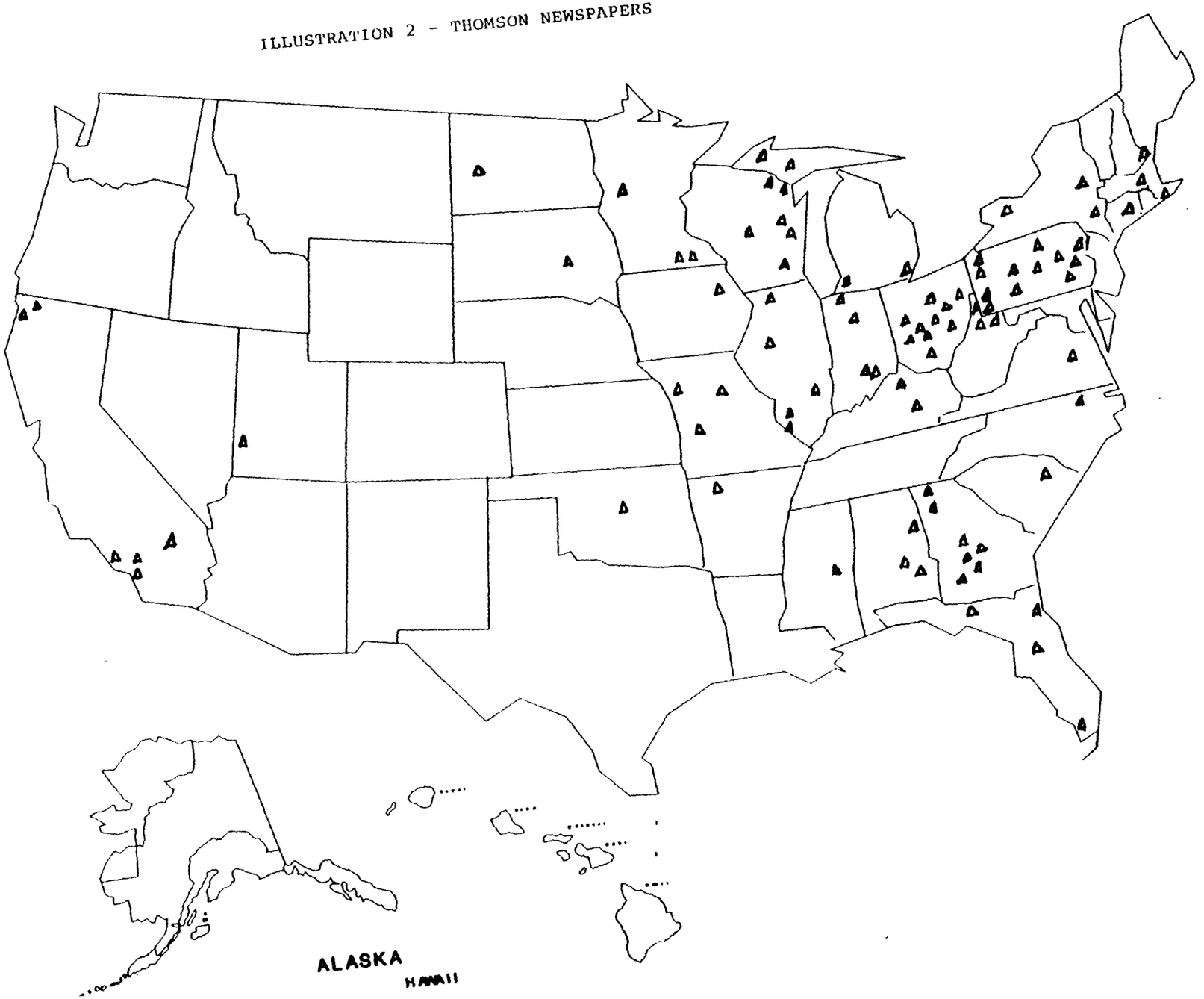


ILLUSTRATION 2

ILLUSTRATION 3

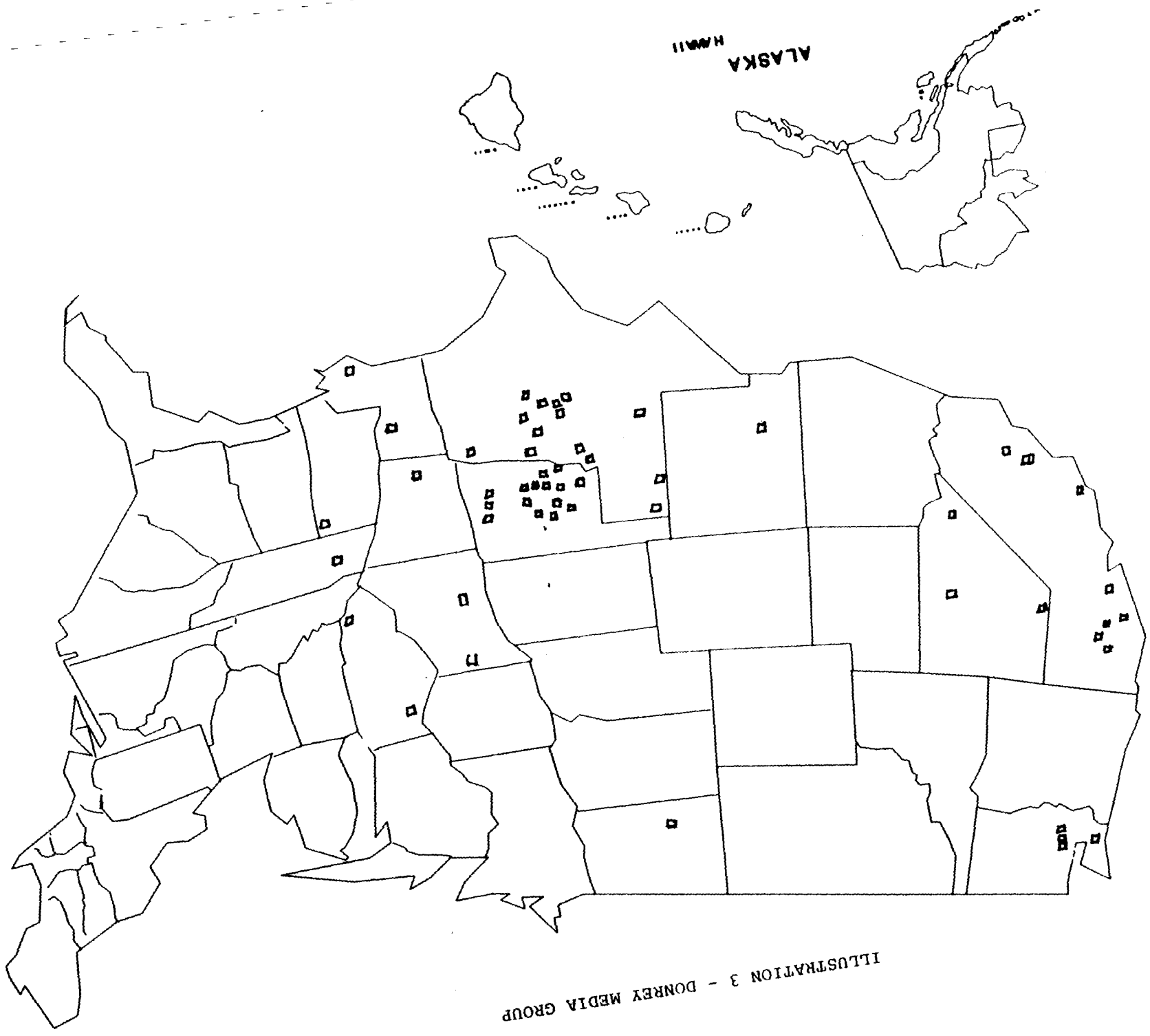
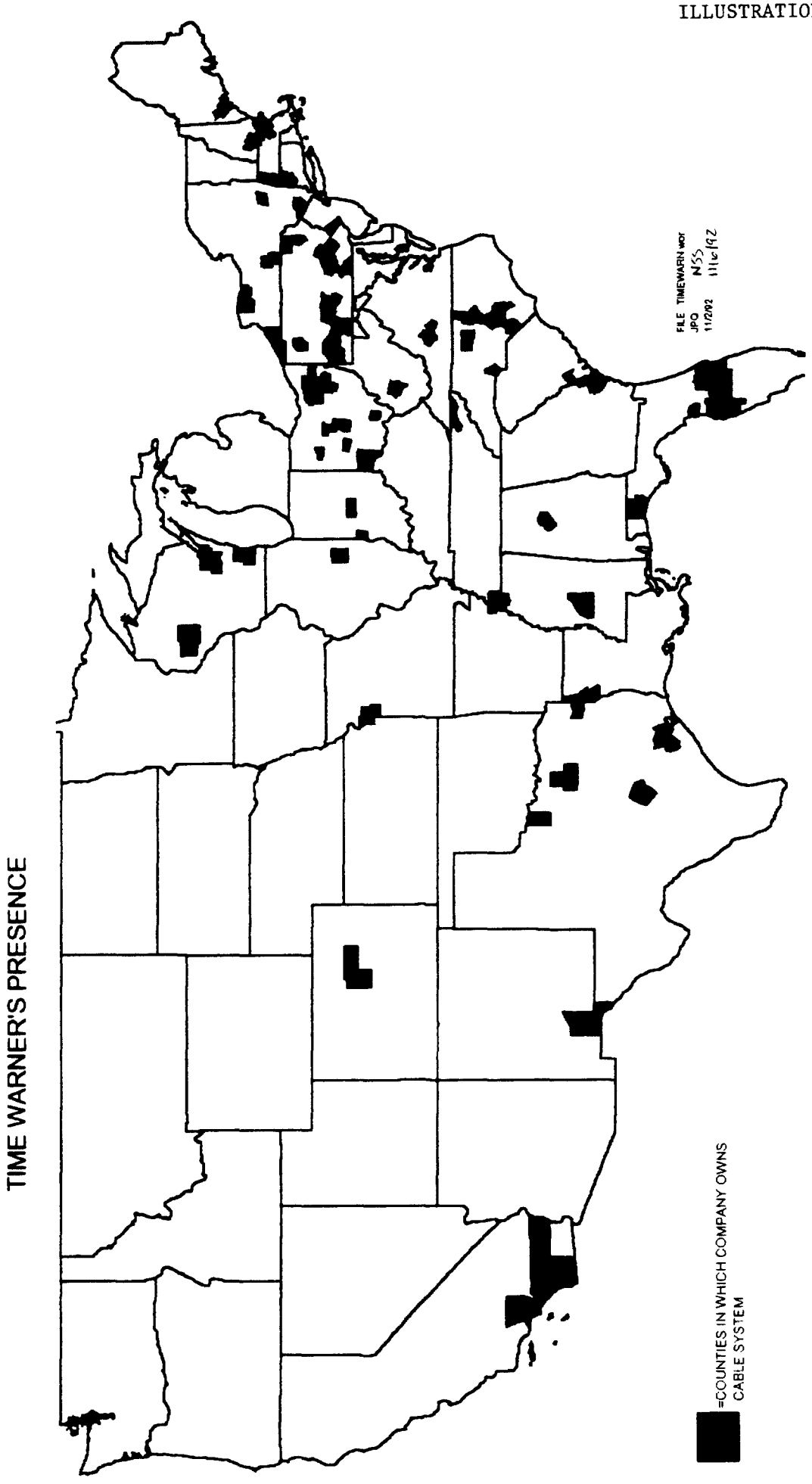


ILLUSTRATION 3 - DONREY MEDIA GROUP

ILLUSTRATION 4



UNITED ARTISTS ENTERTAINMENT'S PRESENCE

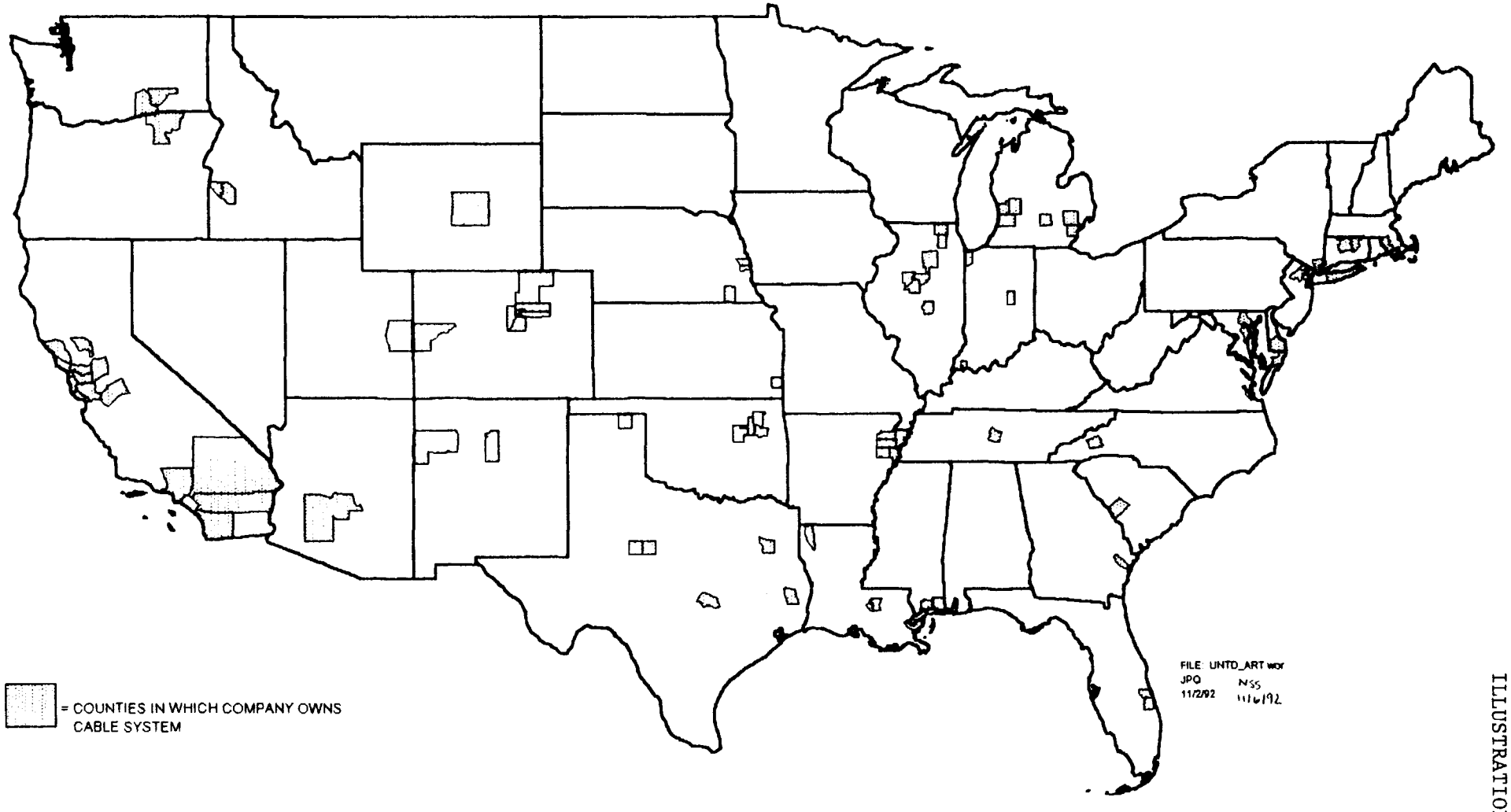


ILLUSTRATION 5

TELE-COMMUNICATIONS, INC.'S PRESENCE

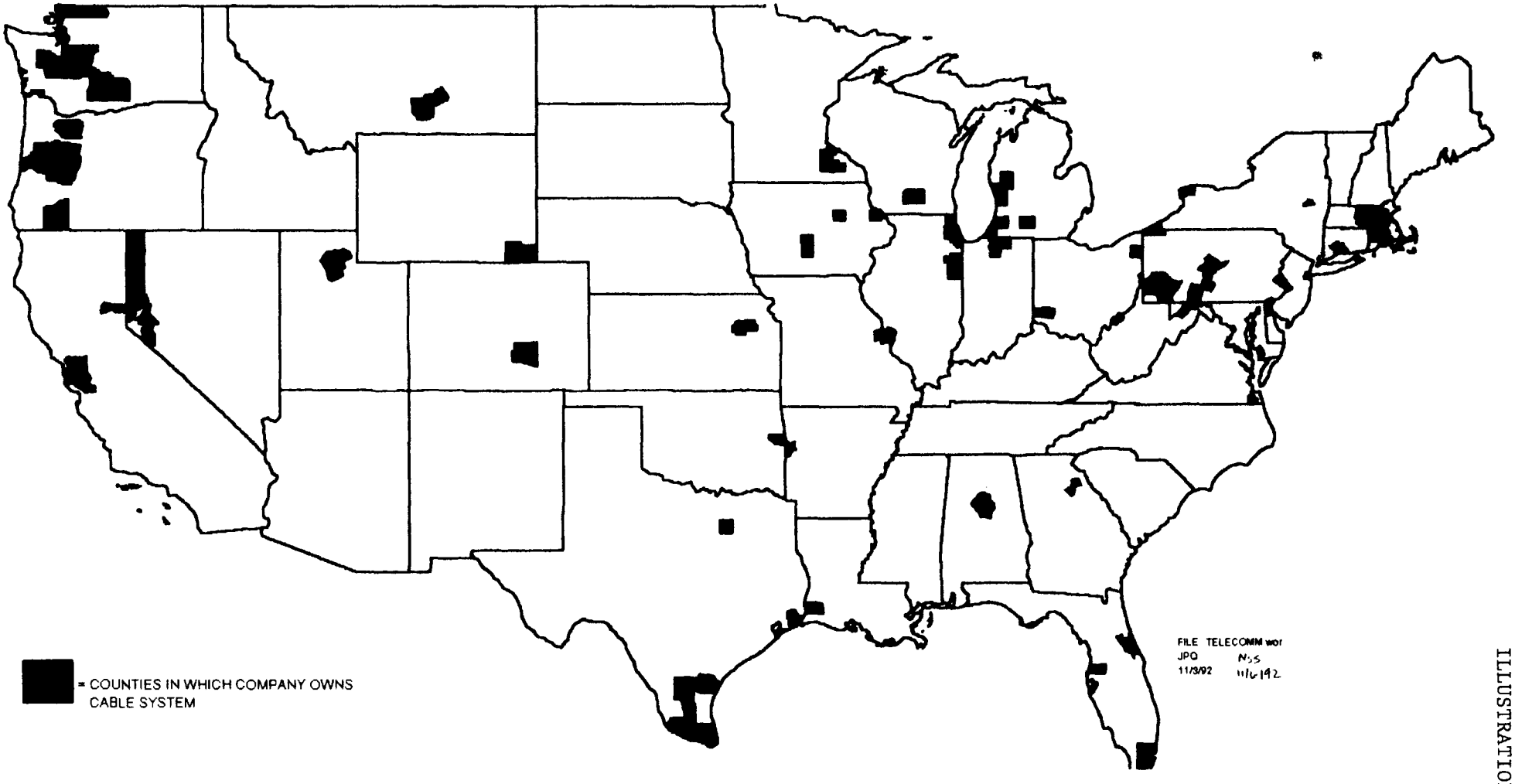


ILLUSTRATION 6

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Consultant to Rand Corporation	1981-83

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BOOKS

INTERNATIONAL TRADE IN FILMS AND TELEVISION PROGRAMS, with Stephen E. Siwek, Ballinger, 1988.[1]

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